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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,977	03/05/2002	Thomas A. Bachman II	ANCO-54US/124	7573

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WOOD, HERRON & EVANS, LLP
2700 CAREW TOWER
441 VINE STREET
CINCINNATI, OH 45202

EXAMINER	
NGUYEN, THUAN T	
ART UNIT	**PAPER NUMBER**
2685	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/090,977	BACHMAN ET AL.	
	Examiner	Art Unit	
	THUAN T. NGUYEN	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 27-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 27-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

1. Applicants elect claims 1-14 and 27-40 for examination, without traverse, and withdraw claims 15-26 as non-elected claims.

Claim Rejections - 35 USC 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> *A person shall be entitled to a patent unless –*
>
> *(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.*

3. Claims 1-14 and 27-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Ocenasek et al. (U.S. Patent No. 6,674,324 B1).

Regarding claim 1, Ocenasek discloses "an apparatus" (Fig. 3), comprising:

(a) a signal path configured to communicate an RF communications signal disposed in a frequency band (Fig. 3, and col. 5/lines 30-62 for RF signals in a frequency band are received in the receiver circuitry); and

(b) a circuit arrangement configured to suppress intermodulation distortion (IMD) products from the RF communications signal by analyzing the signal path to identify at least one active channel among a plurality of channels in the frequency band, identifying at least one portion of the frequency band likely to include IMD products based upon the identified active channel(s), and

suppressing from the RF communications signal the IMD products at the identified portion of the frequency band" (Fig. 3, col. 6/lines 44-67 for a portion of frequency range of operation can be detected; col. 7/lines 20-46 and col. 9/line 55 to col. 10/line 42 for IMD are being monitoring, detecting, and suppressing or IMD distortion cancellation being addressed using distortion cancellation loop 86 of active carrier channels, and the suppression of IMD based on the detection of IMD products at the identified active channel or at the identified portion of the frequency band of operation).

For claim 2, in view of claim 1, Ocenasek discloses "wherein the plurality of channels in the frequency band are each associated with a non-varying carrier frequency", i.e., a non-varying carrier frequency is used for each associated one of the plurality of channels in the frequency band, for instance, a 3.84 MHz carriers for UMTS system (col. 7/lines 48-65 & col. 8/lines 22-38).

For claim 3, in view of claim 1, Ocenasek discloses "wherein the frequency band is the Universal Mobile Telecommunications System (UMTS) frequency band" (col. 7/lines 48-68).

For claim 4, in view of claim 1, Ocenasek discloses "wherein the circuit arrangement is configured to identify each active channel by detecting an active signal at a carrier frequency associated with such active channel" (col. 10/lines 4-22 as already disclosed in claims 1 & 2 above).

For claim 5, in view of claim 4, Ocenasek discloses "wherein the circuit arrangement includes a scanning receiver coupled to the signal path, the scanning receiver configured to be tuned to a selected carrier frequency and to output a power signal representative of the power in the signal path at the selected carrier frequency", i.e., the receiving circuitry 90 of Figure 3 acts

as a scanning receiver because of the ability of tuning of IMD cancellation loop, determining the power control, adjusting the amplitude and phase response of equalizer 100 to reduce IMD or distortion across the frequency band of operation (col. 14/lines 18-59); and corresponding power levels are adjusted and provided at the selected carrier frequency since the amplitude of the signals within Oceanek referring to the power level (see col. 15/lines 20-34).

For claim 6, in view of claim 5, Ocenasek discloses "wherein the circuit arrangement is configured to sequentially tune the scanning receiver to each of a plurality of carrier frequencies, compare the power signal output by the scanning receiver at each carrier frequency to a threshold, and identify an active channel among the plurality of channels based upon the comparison of the power signal output by the scanning receiver when tuned to a carrier frequency associated with such active channel to the threshold" (col. 8/lines 22-38 for a threshold for active RF carrier signals, and col. 10/lines 3-42, and col. 14/lines 18-59 for comparison and adjusting the amplitude and phase to reduce IMD process).

For claims 7 and 8, in view of claim 5, Ocenasek discloses "wherein the circuit arrangement is configured to determine whether the identified active channel(s) constitute a valid channel configuration" and "wherein the circuit arrangement is configured to store a value associated with the power signal at each carrier frequency" (col. 8/lines 22-38 for the digital receiver 90 includes a frequency bin for storing values associated with the power signals at each carrier frequency for active and valid channels (col. 8/lines 22-38; and further in col. 11/lines 1-40 for situation when there is no or very few active carrier signals) as well as including a data buffer connected to a memory and/or flash memory for storing digital samples or representatives (col. 8/lines 9-21).

For claims 9 and 10, in further view of claim 5, Ocenasek discloses "wherein the circuit arrangement is further configured to suppress the IMD products by tuning the scanning receiver to the identified portion of the frequency band, monitoring the power signal when the scanning receiver is tuned to the identified portion of the frequency band, and adjusting at least one of a phase and magnitude of a suppression signal applied to the signal path so as to reduce the signal power in the signal path within the identified portion of the frequency band" and "wherein the circuit arrangement is further configured to identify a plurality of portions of the frequency band likely to include IMD products, and to suppress the IMD products by tuning the scanning receiver to each identified portion of the frequency band, monitoring the power signal when the scanning receiver is tuned to such identified portion of the frequency band, and adjusting at least one of a phase and magnitude of a suppression signal applied to the signal path so as to reduce the signal power in the signal path within the plurality of identified portions of the frequency band" (i.e., the steps of monitoring and adjusting magnitude and phase of the suppression signal or carrier signals with IMD products are already addressed earlier in claims 5 & 6).

For claim 11, in view of claim 1, Ocenasek suggests "wherein the RF communications signal comprises a multi-carrier communications signal", i.e., multi-carrier communications signal from other GSM carrier, TDMA carrier, etc. can be applied (col. 8/lines 22-38).

For claim 12, in view of claim 1, Ocenasek discloses "wherein the at least one active channel includes first and second channels respectively associated with respectively associated with first and second carrier frequencies, and wherein the circuit arrangement is configured to determine the identified portion of the frequency band by performing a calculation selected from the group consisting of subtracting a spectral distance between the first and second carrier

frequencies from the first carrier frequency and adding the spectral distance between the first and second carrier frequencies to the second carrier frequency", i.e., spectral distance is addressed (col. 2/lines 22-41) and positioned for the pilot signal, and the injection of the pilot signal and adjusting its amplitude and phase creating the subtraction or addition a spectral distance between the first and second carrier signals (col. 14/lines 18-59 as described in Figure 1 of prior art, ans again col. 2/lines 22-41).

For claim 14, in view of claim 1, Ocenanek discloses "wherein the RF communications signal comprises a multi-carrier signal" (col. 8/lines 22-38), the apparatus further comprising:
(a) a power amplifier disposed in the signal path and configured to output a multi-carrier output signal (Fig. 3/item 12 for a power amplifier, and col. 3/lines 45-61); and
(b) a feed forward signal path coupled in parallel with the signal path; wherein the circuit arrangement is configured to generate a suppression signal in the feed forward signal path that, when combined with the multicarrier output signal generated by the power amplifier, reduces the IMD products in the multi-carrier output signal (as shown in Fig. 3, item 80 for a feed forward path coupled in parallel to the signal path of concern or circuitry 90 at RF switch 108, and the signal path of concern provides a suppression signal to reduce IMD products as explained through out the action).

Regarding claims 27-38 and 40, these claims for "a method of suppressing intermodulation distortion (IMD) products in an RF communication system operating within a frequency band, the method comprising: (a) analyzing an RF communications signal communicated by a signal path in the RIF communication system to identify at least one active channel among a plurality of channels in the frequency band; (b) identifying at least one portion

of the frequency band likely to include IMD products based upon the identified active channel(s); and (c) suppressing from the RF communications signal the IMD products at the identified portion of the frequency band" with same limitations addressed earlier are rejected for the reasons given in the scope of claims 1-12 and 14 as disclosed in details above.

Claim Rejections - 35 USC 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

5. Claims 13 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ocenasek et al. (U.S. Patent No. 6,674,324 B1).

Regarding claims 13 and 39, in view of claim 1, Ocenasek does not discloses "wherein the at least one active channel includes first and second channels, wherein the first and second channels are respectively associated with first and second carrier frequencies, and wherein the circuit arrangement is configured to determine the identified portion of the frequency band by accessing a lookup table indexed by the first and second carrier frequencies"; however, Ocenasek discloses including a memory within the digital receiver 90 and contains frequency bins for storing carrier signals (as explained earlier in claims 7-8, col. 10/lines 3-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ocenanek's frequency bins with a known technique in creating a lookup table with

indexes as a database structure within the memory in order to easily identifying the carrier frequencies whether a first, a second or N carrier signal as preferred.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: McLaren, Schick and Wickman (in PTO 892 attached) disclose systems related to apparatuses for reducing or cancellation of IMD products.

7. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to: (703) 872-9306, (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Thuan Nguyen whose telephone number is (703) 308-5860. The examiner can normally be reached on Monday-Friday from 9:30 AM to 7:00 PM, with alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the **Technology Center 2600 Customer Service Office** whose telephone number is **(703) 306-0377.**

TONY T. NGUYEN
PATENT EXAMINER

Tony T. Nguyen
Art Unit 2685
January 18, 2005